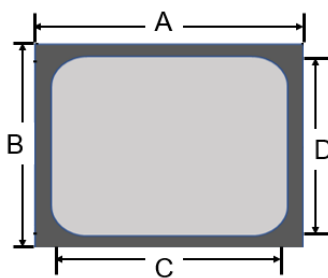




SMD05C120KM 1200V 5A SiC Schottky Diode

DESCRIPTION: SM provides leading edge technology for the SiC Schottky barrier diodes with the advanced thin-wafer technology. The new family of 1200V products showing improved efficiency over all load conditions, attributed to its lower figure of merit ($Q_c \times V_f$).

DIE INFORMATION



FEATURES

- 1200V Schottky Barrier Diode
- Zero Reverse Recovery/Zero Forward Recovery
- 100% UIS screened
- Temperature Independent Switching Behavior

TYPICAL APPLICATIONS

- Switch mode power supply
- Power factor correction
- Solar inverter
- Uninterruptible power supply

MAJOR RATINGS AND CHARACTERISTICS

Symbol	Parameter	Value	Unit	Test Conditions
V_{RRM}	Repetitive Peak Reverse Voltage	1200	V	
V_R	DC Peak Blocking Voltage	1200	V	
I_F	Continuous Forward Current	5	A	$T_C=175^\circ\text{C}$
I_{FRM}	Repetitive Peak Forward Surge Current	25	A	$T_C=25^\circ\text{C}$, $t_p = 10$ ms, Half Sine Wave
I_{FSM}	Non-Repetitive Peak Forward Surge Current	50*	A	$T_C=25^\circ\text{C}$, $t_p = 10$ ms, Half Sine Wave
$\int i^2 dt$	$i^2 t$ value	12.5	A^2s	$T_C=25^\circ\text{C}$, $t_p=10$ ms, Half Sine Wave



T_j, T_{stg}	Operating Junction and Storage Temperature	-40 ~ +175	°C	
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ELECTRICAL CHARACTERISTICS (25 °C unless otherwise noted)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
V_{DC}	DC blocking voltage	1200			V	$I_R = 250\mu A, T_J = 25\text{ °C}$
V_F	Forward Voltage		1.5 2.2	1.75	V	$I_F = 5A, T_J = 25\text{ °C}$ $I_F = 5A, T_J = 175\text{ °C}$
I_R	Reverse Current		0.5 3.5	20	μA	$V_R = 1200V, T_J = 25\text{ °C}$ $V_R = 1200V, T_J = 175\text{ °C}$
Q_C	Total Capacitive Charge		25.8		nC	$V_R = 800V$
C	Total Capacitance		0.302 0.026 0.021		nF	$V_R = 0V, T_J = 25\text{ °C}, f = 1\text{ MHz}$ $V_R = 400V, T_J = 25\text{ °C}, f = 1\text{ MHz}$ $V_R = 800V, T_J = 25\text{ °C}, f = 1\text{ MHz}$
E_C	Capacitance Stored Energy		6.72		μJ	$V_R = 800V$

MECHANICAL PARAMETERS

PARAMETERS	TYP	UNIT
Die Size	1.60×1.59	mm
Anode Pad Opening	1.23×1.23	mm
Thickness	100 ± 10	μm
Wafer Size	150	mm
Anode Metalization Al	4	μm
Cathode Metalization	Ti/Ni/Ag	/
Frontside Passivation	Polyimide	/



Typical Characteristics

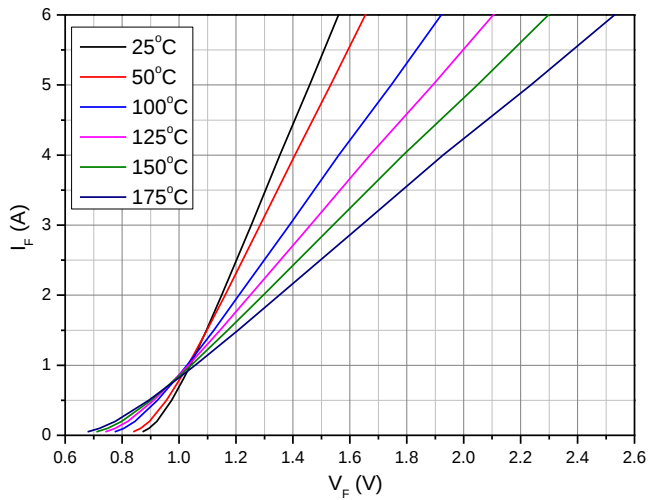


Figure 1. Forward Characteristics

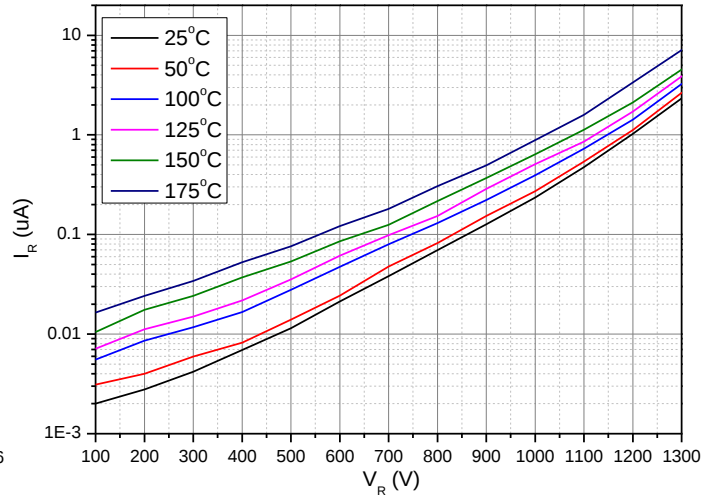


Figure 2. Reverse Characteristics

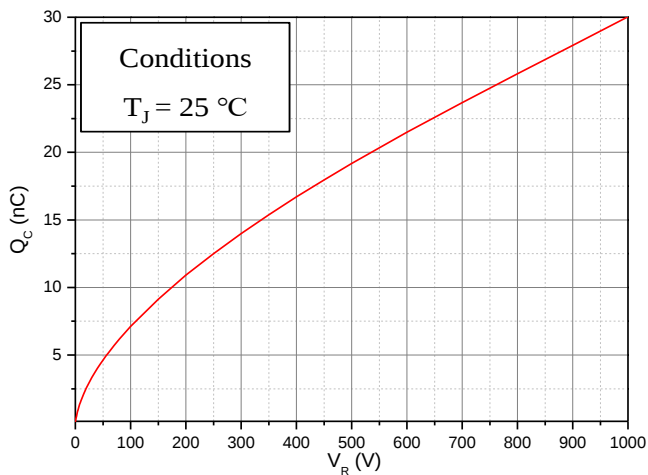


Figure 3. Total Capacitance Charge vs. Reverse Voltage

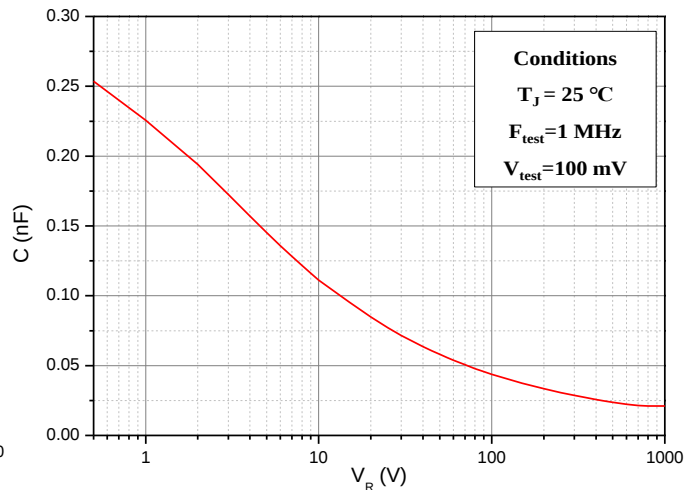
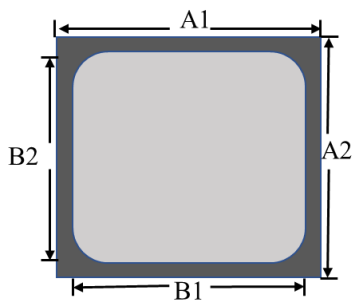


Figure 4. Capacitance vs. Reverse Voltage

Chip Dimensions



symbol	Dimens on	
	mm	inch
A 1 (die size)	1.60	0.063
A 2 (die size)	1.59	0.063
B1 (anode pad opening)	1.23	0.049
B2 (anode pad opening)	1.23	0.049



Notes

- Some data are test results of the die packaged by TO220.
 - This product has not been designed or tested for use in, and is not intended for use in, applications implanted into the human body nor in applications in which failure of the product could lead to death, personal injury or property damage, including but not limited to equipment used in the operation of nuclear facilities, life-support machines, cardiac defibrillators or similar emergency medical equipment, aircraft navigation or communication or control systems, or air traffic control systems.
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